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THROMBOCYTOSIS A CHRONIC MYELOPROLIFERATIVE DISEASE MAY ALSO OCCUR SECONDARY TO BENIGN CONDITION APART FROM NEOPLASIA

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ABSTRACT

Thrombocytosis a hemograms finding of children made puzzled pediatrician to determine the cause and need for therapy.Reactive Thrombocytosis is very common. Fortunately essential thrombocytosis is rare in pediatric age group.

KEYWORDS: Thrombocytosis; Thrombopoietin; Childhood; Reactive; Hematological.

INTRODUCTION

Thrombocytosis or thrombocythemia is defined as a platelet count above the upper limit of the normal range (1).

Platelet count >420,000/mm3 in infancy and childhood is considered as abnormal. It is seen in 3-13% of children (2).Pediatrician become confuse to determine the underlying cause of thrombocytosis and the need of therapy.

Thrombocytosis is classified either primary or secondary .Childhood thrombocytosis is mostly reactive with reported incidence of 6-15%(3) and associated with elevation of many marker of the acute phase reactant like C-reactive protein and erythrocyte sedimentation rate(4).In older adult thrombocytosis can signify an underlying hematological disease while in children it is due to another medical condition like acute or chronic inflammation, collagen vascular disease, renal disease, iron deficiency, hemolytic anemia and Kwasaki's disease (5,6,7).Drugs are also secondary cause of thrombocytosis in children (8,9,10).Thrombocytosis associated with solid tumours, bone marrow metastases and other neoplastic disease is mild and persistent(11).We present a case of reactive thrombocytosis in a child with right upper lobe consolidation. We also describe in brief the treatment and its evolution.

Table -1 CAUSES OF THROMBOCYTOSIS

*** Primary hematological thrombocytosis.**
: Essential thrombocytosis
: Primary myelofibrosis
: Myelodysplasia with del(5q)
: Chronic myeloid leukaemia
: Myelodysplstic syndrome/myeloproliferative neoplasm, unclassifiable (MDS/MPN-U)
***Secondary or reactive thrombocytosis**
: Infection (Respiratory tract, Gastrointestinal tract etc)
: Hemolytic and iron deficiency anemia
: Bleeding
: Connective tissue disease (juvenile rheumatoid arthritis ,small and large vessel vasculitides including Wegener's
granulomatosis ,Polyarteritis nodosa and other).
: Kwasaki's disease.
: Inflammatory bowel disease.
: Langerhans cell histiocytosis.
: Malignancies (mostly solid tumours, such as hepatoblastoma, hepatocellular carcinoma, neuroblastoma and rarely acute lymphoblastic leukaemia).
: Drugs (adrenaline, corticosteroid, vinca alkaloid ,iron,antibiotics, narcotics etc).
: Trauma, Burns, Tissue injury.
: Intense exercise.
: Spleenectomy (Surgical or functional e. g sickle cell anemia.)

Pathophysiology of Thrombocytosis:-

Key regulator of platelet production is thrombopoietin (Tpo). Thrombopoietin expressed in liver, kidney ,bone marrow and other organ (12).Other than Tpo, stem cell factor, IL-6,IL-8 and IL-11 play a major role in thrombopoiesis (13,14).Tpo acts through c-mpl receptor on the commitment of hematopoiesis stem and progenitor cells into platelet specific differentiation. Thromopoietin level are higher in essential thrombocytosis (15).

CASE STUDY:-

Hospital admission: A eight year old girl with fever for 14 days, cough and asthenia attended hospital. She got OPD based treatment with oral azithromycin ,amoxicillin/clavulanic acid and cefixime without any result. She had no family history of Pulmonary Koch's or other history of interest .Her Spo2 was 90-92% associated with tachypnea and chest pain .Moist oxygen was started and following were advised-

1. Chest X ray-Right upper zonal dense opacity(fig-1)

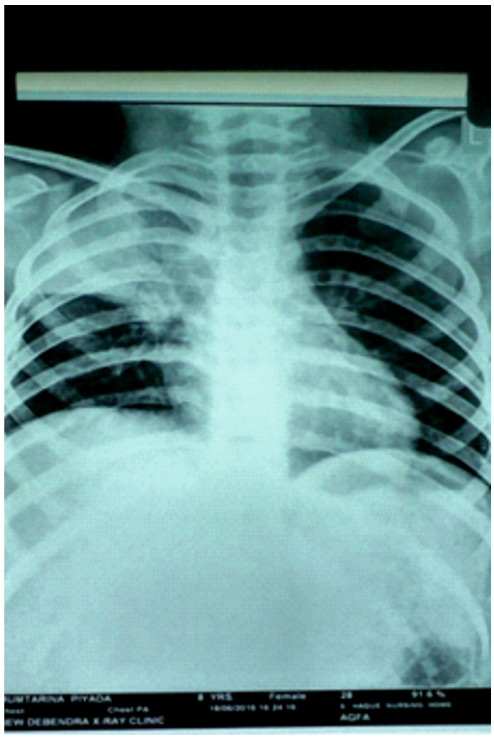

Fig : 1 - Chest X ray

2. Complete blood count-(13,040/mm3 , Neutrophil - 83%,Hb-9.3 gm/dl, Platelet count-8.25L/mm3).
3. Biochemistry -Normal.CRP-8.7mg/dl.
4. Sputum for Acid Fast Bacillus-Not found.

5. Sputum for Gram stain-No Gram +cocci.

We presume it is a case of Pneumonia, intravenous treatment with Piperecilline/ tazobactum was started.

Second day of Hospitalisation:
In spite of this therapy respiratory distress increase and she become more toxic. We replace Piperacilline/tazobactum with Linezolid . In addition a repeat CBC was done with the following result -Total white blood cell count 31,100/mm3,Hb-9.2%,Platelet count-8.94L/mm3.

Third day of Hospitalisation:
Patient's condition did not show any change .As the chest X -Ray said dense opacity rather than air bronchogram associated with thrombocytosis and no response with intravenous antibiotics we become puzzled. It was decided to modify the therapy. We stop intravenous antibiotics and started with oral clarithromycin and asked for computed tomography(CT) of the chest and CT guided Fine Needle Aspiration Cytology if any SOL(Space Occupying Lesion).Hematological consultation was taken and recommended for further diagnostic test which were normal(Red blood cell morphology, coagulation study with protein C, antithrombin III, autoimmunity, paraneuplastic phenomenon, alphafoetoprotein and chorionic gonadotrphin).

Fourth day Hospitalisation:
The interval between the peak of raised temperature increase. Some supplementary test were also performed which were negative.

a. Polymerase chain reaction for mycoplasma pneumoniae and respiratory viruses.

b. Blood test for chlamydia species. influenza viruses.

c. Echocardiogram.

d. Ultrasonography of abdomen.

In the mean time CT Scan of chest revealed(fig-2&3) that there is air bronchogram and it is consolidation ,there is no need of FNAC, and the girl improved with oral clarithromycin.

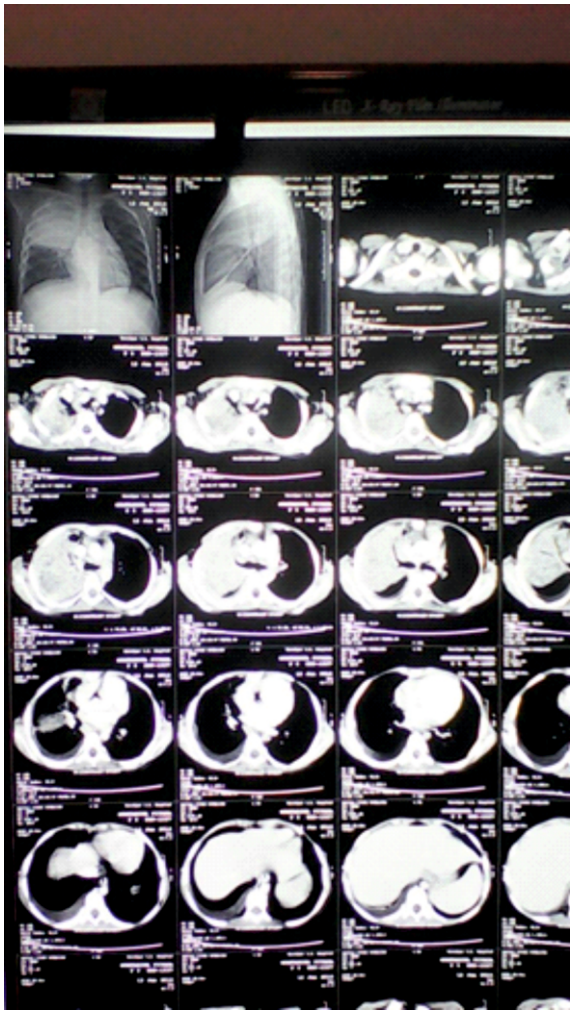

Fig. - 2

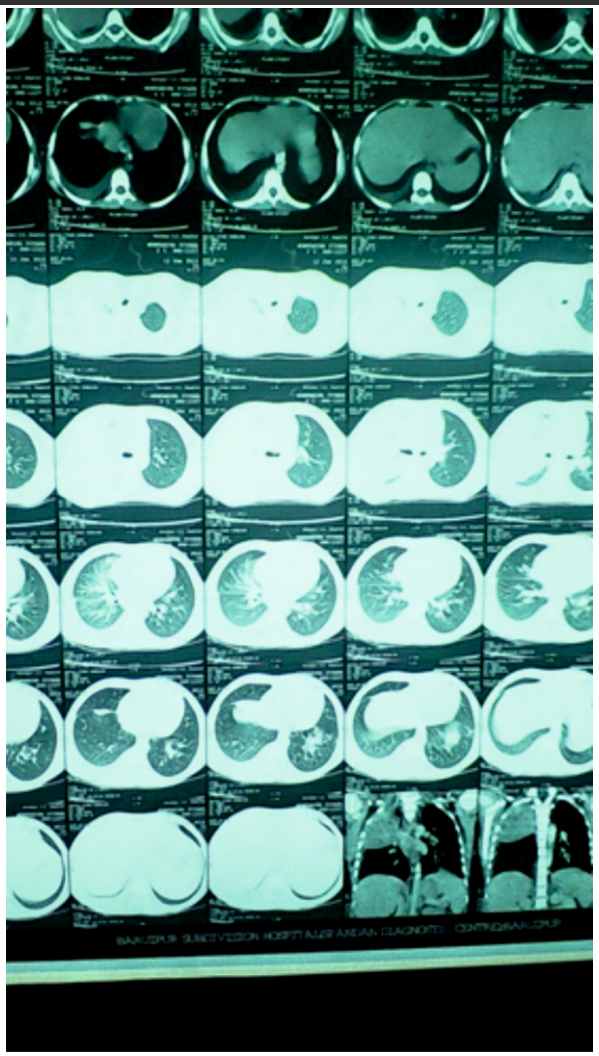

Fig. – 3

Fifth day of Hospitalisation :
Patient did not complaint of headache, abdominal pain or vasomotor phenomenon so treatment with aspirin was not considered. We decided not to modify the treatment and wait to see the evolution of the patient.

Sixth, seventh day of Hospitalisation:
The girl become afebrile, general condition improved and the laboratory values normalised.

Eigth day of Hospitalisation up to discharge:
The patient remains afebrile , no headache or abdominal pain , Platelet count normalised(2.70L/mm3).

The thrombocytosis was considered to be secondary to Pneumonia and primary cause of thrombocytosis was ruled out.

She is currently in follow up and her platelet count is normal without treatment.

DISCUSSION:
Thrombocytosis is categorized in to four degrees: mild(500,000-700,ooo/mm3), moderate (>700,000-900,000/mm3),severe (>900,000/mm3) and extreme or massive (>1,000,000/mm3) (16,17).Our aim is to stabilise and treat the patient and subsequently to determine the cause of thrombocytosis whether it is primary or secondary(Table-1).The differential diagnosis is made based on the patient's signs and symptoms(18) and diagnostic test .In pediatric age group regardless of the cause of thrombocytosis most of the patients will remain asymptomatic. Very small number of cases may develop vasomotor phenomena (headache, visual symptoms, nausea, vertigo etc),thrombotic phenomena or hemorrhage(19,20).Here our patient was presented with thrombocytosis secondary to pneumonia. We treat the underlying infection and rule out a primary cause of thrombocytosis. Apart from antibiotic no supportive measure other than moist oxygen required for our patient, as she did not develop any complication of thrombocytosis such as bleeding, thrombosis or vasomotor phenomena.

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